

CLAIMS

1. A mold which includes an arrangement to assist in controlling of a temperature of the mold including at least one closed chamber within the mold, the chamber being only partially filled with liquid and a remainder of the chamber being
5 filled with substantially only vapour of the liquid within the chamber, at least a portion of the chamber being positioned to transmit heat from a targeted location of the mold into liquid within the chamber, and condensing means by reason of heat exchange to effect condensation of vapour within the chamber, the mold being characterized in that the liquid is arranged, in use, to be distributed in the chamber in
10 such a way that the liquid will be distributed to reach or be held at different heights within the chamber.
2. A mold as in the preceding claim further characterized in that the different heights of liquid are achieved by having at least one reservoir within the chamber with a bottom of the reservoir being above a bottom of the chamber.
- 15 3. A mold as in either one of the preceding claims further characterized in that the different heights are achieved by having the liquid being applied as a surface application onto an inner surface of the chamber and above a base level of liquid within the chamber.
- 20 4. A mold as in any one of the preceding claims further characterized in that the different heights are achieved by having a passageway with some of the liquid in the passageway where an inlet at least to the passageway is above a base upper level of liquid in the chamber.
- 25 5. A mold as in any one of the preceding claims further characterized in that the different heights are achieved by having the liquid selected or having an additive whereby to effect a foaming.
6. A mold as in claim 1 further characterized in that the liquid includes a foaming agent.
7. A mold as in any one of claims 1 or 2 further characterized in that the liquid is predominantly water and the foaming agent is a surfactant.

8. A mold as in any one of the preceding claims further characterised in that there is a passageway of liquid into a passage forming a part of the chamber having dimensions where surface tension of the liquid would otherwise inhibit passage of liquid thereinto.
- 5 9. A mold as in any one of the preceding claims further characterized in that there is at least one reservoir for liquid in the said chamber which is adapted to hold liquid so that a head of liquid in such a reservoir is less than the height of such liquid above other liquid in the chamber.
- 10 10. A mold as in any one of the preceding claims further characterized in that there is provided a substantially vertical conduit with a lower inlet and an upper outlet and a heat source adjacent a part of such conduit, and a means to hold any liquid lifted through the conduit by boiling of liquid effecting a percolator type effect, at a height above a normally existing upper level of liquid in the chamber.
- 15 11. A mold as in the immediately preceding claim further characterized in that there are means to gather liquid within the chamber but at a height higher than an entry position into a conduit shape and means to effect through an injector conduit, a supply of such liquid through the injector conduit into the conduit shape.
- 20 12. A mold as in the immediately preceding claim further characterized in that there is a reservoir beneath an area providing for condensing of any vapour within the chamber and a conduit extending from such a reservoir down into the injector conduit which has an aperture through which the liquid then will flow at a rate depending upon the head of liquid and the size of the conduit.
- 25 13. A mold as in any one of the preceding claims further characterized in that there is provided a conduit which forms a part of the closed chamber which has an inlet at a lower position within the chamber such that this inlet will be below a normal liquid level within the chamber, and an upper outlet which will direct liquid into a holding reservoir.
- 30 14. A mold as in the immediately preceding claim further characterized in that there is provided in an adjacent vicinity to the conduit, a means to provide a source of heat.

15. A mold as in any one of the preceding claims further characterized in that there is provided at least one dam or reservoir which holds a limited amount of the liquid and which is arranged to collect the liquid from time to time during the boiling of the liquid in the chamber either by reason of rapid transition to vapour effects causing substantial ebullition and therefore implicit lifting of the liquid to appropriate heights, or by reason of condensate being directed to one or more of the dams or reservoirs.
16. A mold as in any one of the preceding claims further characterized in that the reservoir or dam or dams are arranged to overflow as they are filled with the liquid and this cascading effect can ensure that each of the reservoir and dams are kept to only a selected level and therefore head pressure and therefore maintain a reasonably small range of temperatures at which the liquid will boil within that selected reservoir or dam.
17. A mold as in any one of the preceding claims further characterized in that there is applied, a surface material to an inner wall of the chamber.
18. A mold as in the immediately preceding claim further characterized in that at least some parts of the inner surface of the chamber are coated with a material such that surface tension implicit between the liquid and the material will assist in continuing retention of the liquid against the wall.
19. A mold as in preceding claim 17 further characterized in that flock in the form of a number of short strands of fiber is attached end on in close vicinity one to the other, to the surface so that liquid which reaches any such selected area thus treated, will be held to be of greater depth and therefore act as a greater reserve.
20. A mold for molding of plastics material where there is a closed chamber using the heat transfer system described to effect a transfer of heat, characterised in that at least some of the surface of the chamber has attached thereto further material or materials to assist in retention of the liquid in the adjacent vicinity of a target surface of the wall of the chamber.
21. A mold as in the immediately preceding claim further characterized in that the liquid is water.
22. A mold as in the immediately preceding claim further characterized in that

the foaming agent is a foam causing surfactant.

23. A mold as in any one of the preceding claims further characterized in that replenishment is effected by foam causing film of the liquid to pass across the selected surface area wetting this thereby.

5 24. A mold as in any one of the preceding claims further characterized in that there is a passageway connecting with liquid in the chamber which passageway is closed at an upper end and which has at least a portion which can be seen through to the extent that any liquid level within the passageway can be externally determined and the position of the passageway including its entry and its closed upper end, is such that a level of liquid within the passageway will change from a first level where a first evacuation status within the chamber exists, to a second level where the degree of evacuation within the chamber is less than the first said evacuation status.

15 25. A method of effecting heat transfer within a closed chamber of a mold for the purposes described where the method includes having within the closed chamber only liquid, and the vapour of the liquid within a space above the liquid within the chamber, and where a surface of the chamber selected for purpose of extracting heat therefrom is above a level of the liquid within the chamber and where the liquid level is at different heights within the chamber.

20 26. A method of effecting heat transfer within a closed chamber of a mold for the purposes described where the method includes having within the closed chamber only liquid, and the vapour of the liquid within a space above the liquid within the chamber, and where a surface of the chamber selected for purpose of extracting heat therefrom is above a level of the liquid within the chamber and
25 effecting replenishment of liquid in respect of that selected area from time to time where the selected area includes a treatment to effect retention of the liquid by use of surface tension of the liquid.

30 27. A method of effecting heat transfer within a closed chamber for the purposes described where the method includes having within the closed chamber only liquid, and the vapour of liquid within a space above the liquid within the chamber, and where a surface of the chamber or condenser for purpose of extracting heat therefrom is above a level of the liquid within the chamber and effecting replenishment of liquid in respect of that selected area from time to time

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where the selected area includes a treatment to effect retention of the liquid by use of surface tension of the liquid.

28. A mold substantially as described in the specification with reference to and as illustrated by the accompanying drawings.
- 5 29. A method of effecting heat transfer within a mold substantially as described in the specification with reference to and as illustrated by the accompanying drawings.